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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/335,956	06/18/1999	DAVID C. WARD	IGI-001CN3	7090

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LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER
FORMAN, BETTY J

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/335,956	WARD ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- *If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.*
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16 and 19-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1- 19-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL ACTION

1. This action is in response to papers filed 23 January 2003 in which claims 19-21were added and the previous rejection of Claim 16 was argued. The new claims have been thoroughly reviewed and entered. All of the arguments have been thoroughly reviewed and are discussed below.

The previous rejections of Claim 16 in the Office Action dated 24 July 2002 are maintained. New grounds for rejection necessitated by the new claims are discussed.

Claims 16 and 19-21 are under prosecution.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al. (U.S. Patent No. 5,447,841, filed 14 December 1990) and Pinkel et al (Proc. Natl. Acad. Sci. USA 1988, 85: 9138-9142).

Regarding Claim 16, Gray et al. teach a method for determining over-representation or under-representation of a selected chromosome (Column 5, lines 6-22 and Claim 6) comprising, combining human cells treated so as to render nucleic acid sequences available for hybridization (Column 15, line 66-Column 16, line 16) and a hybridization mixture comprising labeled human DNA derived from a specific chromosome i.e. 21, competitor DNA i.e. human genomic DNA and non-human genomic DNA i.e. lambda DNA under conditions appropriate for hybridization (Column 16, lines 16-20 and 30-41) and detecting labeled human chromosome-specific DNA fragments hybridized to nucleic acid sequences from the cells (Column 16, lines 41-57 and Fig. 1). Gray et al. do not teach the cells are human tumor cells. However, Gray et al. teach the method for determining over-representation or under-representation of a selected chromosome is applicable to cancer diagnosis (Column 5, lines 33-35). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the Gray et al. method for detecting chromosomal abnormalities to tumor cells because tumor cells were known to contain chromosomal over and/or under-representation for the expected benefit of rapid and highly sensitive detection of tumor causing chromosomal abnormalities as taught by Gray et al. (Column 5, lines 29-35).

Additionally, Pinkel et al., co-inventor of the above cited '841 patent, teach the method of labeling individual human chromosomes of interphase cells by *in situ* hybridization the method comprising the steps: providing chromosome-specific labeled probes (page 9138, right column, third full paragraph-page 9139, second paragraph) and competitor DNA; combining the labeled probes and competitor DNA with human chromosomes in interphase cells under hybridization conditions wherein the labeled probes hybridize specifically to the human chromosomes (page 9139, left column, "*In situ* Hybridization"), thereby labeling human chromosomes in interphase cells (page 9139, right column third full paragraph, lines 5-11 and Fig. 1e). Therefore, the teaching of Pinkel et al. confirms the co-authored teaching of Gray et al. wherein their method is applicable to interphase cells (Column 4, lines 58-62).

Regarding Claim 19, Gray et al. teach the method wherein the labeled probes are probes comprising DNA inserts purified from a chromosome-derived recombinant library (Column 14, lines 29-49).

Regarding Claim 20, Gray et al. teach the method wherein the labeled probes are selected from the group consisting of probes labeled with at least one fluorochrome, probes labeled with at least one member of a specific binding pair and probes labeled with an enzymes (Column 10, lines 16-46 and 67-68).

Response to Arguments

4. Applicant argues that Gray et al. fail to teach of suggest the claimed methods so as to enable one of ordinary skill in the art to practice the claimed methods without undue experimentation because while Gray et al. teach their method is applicable to metaphase and interphase cells and they provide exemplification using metaphase cells, they do not provide specific guidance with regard to the myriad of factors required to perform *in situ* hybridization in interphase cells and they do not disclose a single exemplification using interphase cells but rather merely provide a starting point for further experimentation. This argument is not found persuasive because as stated above, Gray et al. teach their method is applicable to interphase cells (Column 4, lines 58-62) and the teaching of Pinkel et al. confirms the co-authored teaching of Gray et al.

Applicant argues that Landegent et al. teach the method is not applicable to interphase cells because the sensitivity of their method at the time of the instant invention is not sufficient for application to interphase cells. This argument is not found persuasive because the teaching of Landegent et al. is drawn to "detection of small (1-2kb) single-copy sequences" and not the claimed "chromosomes" and therefore, the teaching of Landegent et al. is not applicable to the method of Gray et al. which detects labeled chromosomes and the teaching of Pinkel et al. which confirms the method of Gray et al. as applicable to interphase cells.

Furthermore, because Pinkel et al and Gray et al both teach their method is applicable to interphase cells, one of ordinary skill in the art would have applied their method to interphase cells with a reasonable expectation of success.

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al. (U.S. Patent No. 5,447,841, filed 14 December 1990) and Pinkel et al (Proc. Natl. Acad. Sci. USA 1988, 85: 9138-9142) as applied to Claim 16 above and further in view of Smith et al. (Nature, 1986, 321: 674-679)

Regarding Claim 21, Gray et al teach the method wherein the probes are labeled using techniques known in the art and preferably fluorescently labeled (Column 10, lines 16-46 and 67-68) but they do not teach the specific fluorochrome. However, the claimed fluorochromes were well known and practiced in the art at the time the claimed invention was made as taught by Smith et al. who specifically teach commercially available Texas Red, rhodamine and fluorescein (page 675, Fig. 2). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply fluorochromes well know and practiced in the art to the fluorescent teaching of Gray et al. for the expected benefit of the convenience of commercially availability, the ability to perform real-time detection and for the economy of time and labor as taught by Smith et al. (page 674, right column).

Response to Arguments

6. Applicant argues that Grey et al. fail to teach of suggest the claimed methods so as to enable one of ordinary skill in the art to practice the claimed methods without undue experimentation as discussed above and Smith fails to cure the deficiencies of Gray et al. The argument is not found persuasive because as stated above, Gray et al. teach their method is applicable to interphase cells (Column 4, lines 58-62) and the teaching of Pinkel et al. confirms the co-authored teaching of Gray et al.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. No claim is allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (703) 308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1634
July 2, 2003